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New Claims

1. A method for screening for the presence of inhibition of at least one enzyme in the biosynthetic pathway to terpenoids via 1-deoxy-D-xylulose 5-phosphate in plants comprising the following steps:

(a) preparing a suspension of cells or plastids of a plastid-bearing organism in a culture medium for supporting the metabolism of said cells or plastids at least to the extent of said biosynthetic pathway,

(b1) adding to said suspension a predetermined amount of a carbon-13-, carbon-14-, deuterium-, or tritium-labelled biochemical precursor for generating terpenoids via said pathway,

(c1) incubating the mixture obtained in step (b1) for a predetermined period of time at a predetermined temperature,

(d1) separating from said incubated mixture obtained in step (c1) a fraction comprising a product or intermediate downstream from 1-deoxy-D-xylulose 5-phosphate in said pathway,

(e1) detecting the concentration of labelled product(s) in said fraction obtained in step (d1),

(b2) repeating step (b1) with the addition of a predetermined amount of a chemical test sample under otherwise identical conditions,

(c2) to (e2) repeating steps (c1) to (e1) with the mixture obtained in step (b2) under the same conditions as in steps (c1) to (e1) and

(f) determining the presence of inhibition of at least one

enzyme in said pathway by observation of whether the concentration of labelled product(s) detected in step (e1) is higher than that detected in step (e2).

2. The method according to claim 1, wherein the plastid-bearing organism is a monocotyledonous or dicotyledonous plant.

3. The method according to claim 1, wherein the plastid is a chromoplast or a chloroplast.

4. The method according to claim 1, wherein the biochemical precursor is selected from the group consisting of 1-deoxy-D-xylulose, 1-deoxy-D-xylulose 5-phosphate and 2C-methyl-D-erythritol, 2C-methyl-D-erythritol 4-phosphate and 2C-methyl-D-erythritol 4-pyrophosphate.

5. The method according to claim 1, wherein the culture medium comprises ATP in combination with CTP or a source for CTP.

6. The method according to claim 5, wherein the source for CTP is CMP or CDP.

7. The method according to claim 1, wherein an extraction with a lipophilic organic solvent is used for the separation of terpenoids steps (d1) and (d2).

8. The method according to claim 1, wherein the biochemical precursor is a tritiated biochemical precursor and the product is tritiated water.

9. The method according to claim 8, wherein the separation of tritiated

water in step (d1) is effected by a cold trap.

10. The method of claim 9, wherein the cold trap is cooled by liquid nitrogen or solid carbon dioxide.

11. The method according to claim 8, wherein the separation of a predetermined fraction of water in step (d1) is ascertained by a moisture indicator.

12. The method according to claim 11, wherein the moisture indicator is $CoCl_2$.

13. The method according to claim 8, wherein the concentration of tritiated water is measured by liquid scintillation measurement.

14. The method according to claim 8 characterized in that
(a) a multitude of incubations is carried out in parallel in the wells of a first multi-well plate;
(b) a second multi-well plate is placed upside down on the first, so that the wells are registered;
(c) the second plate is cooled with a coolant while the first plate is preferably heated; and
(d) the ice crystals in the wells of the separated and inverted second plate are subjected to liquid scintillation measurement.

15. The method according to claim 14 characterized in that a perforated gasket is placed between the first and the second plate.

16. The method according to claim 14 characterized in that a subset of the

wells is used for a moisture indicator.

17. The method according to claim 8 characterized in that the incubation medium comprises ATP and/or CTP or a source for CTP.

18. The method according to claim 1 wherein the following additional steps are carried out:

(g1) adding to the suspension of step (a) of claim 1 a predetermined amount of a carbon-13-, carbon-14-, deuterium- or tritium-labelled isopentenyl pyrophosphate,

(c3) to (e3) repeating steps (c1) to (e1) of claim 1 with the mixture obtained in step (g1),

(g2) repeating step (g1) with the addition of a predetermined amount of an inhibitor detected in step (f) of claim 1,

(h) ascertaining the absence of inhibition of an enzyme in the biosynthetic pathway downstream from isopentenyl pyrophosphate by said inhibitor.

19. 14-carbon-, 13-carbon-, deuterium- or tritium-labelled 1-deoxy-D-xylulose 5-phosphate or 2C-methyl-D-erythritol 4-phosphate.

20. Tritiated 2C-methyl-D-erythritol 4-phosphate or tritiated 1-deoxy-xylulose 5-phosphate.

21. 2C-Methyl-D-erythritol 4-phosphate tritiated in positions 1 and/or 3 or in the methyl group.

22. 1-Deoxy-D-xylulose 5-phosphate, tritiated in positions 1 and/or 3 and/or 4.

23. A method for inhibiting the growth of a plant by treatment with a herbicidally effective amount of a chemical compound selected from the class of chemical compounds exhibiting inhibition of the biosynthetic pathway to terpenoids via 1-deoxy-D-xylulose 5-phosphate upstream from IPP in the test according to one of claims 1 to 18 excluding treatment with fosmidomycin.

24. A method for inhibiting in chloroplasts of plants an enzyme in the biosynthetic pathway to terpenoids via 1-deoxy-D-xylulose 5-phosphate by treatment with a chemical compound selected from the class of chemical compounds exhibiting inhibition of the biosynthetic pathway to terpenoids via 1-deoxy-D-xylulose 5-phosphate upstream from IPP in the test according to one of claims 1 to 18 excluding treatment with fosmidomycin.

25. An inhibitor exhibiting inhibition of the biosynthetic pathway to terpenoids via 1-deoxy-D-xylulose 5-phosphate upstream from IPP in the test according to one of claims 1 to 17 except fosmidomycin.

26. A herbicidal composition comprising the inhibitor of claim 25 in combination with an agriculturally acceptable carrier.

27. A method for increasing the titer of an intermediate in the biosynthetic terpenoid pathway via 1-deoxy-D-xylulose 5-phosphate upstream from IPP in plants, plant cells, or plastids by treatment with a synthetic inhibitor according to claim 25.

28. Plants or cells or plastids thereof containing a synthetic inhibitor according to claim 25 and exhibiting a titer of an intermediate in the

biosynthetic terpenoid pathway via 1-deoxy-D-xylulose 5-phosphate upstream from IPP which is increased over the titer absent the inhibitor.